



# ARAT BULLETIN



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**"It is Department of the ARMY policy that all smart/brilliant munitions and sensors which require target recognition to function possess a reprogramming capability..."**

**Vice Chief of Staff Army (VCSA) Policy Memorandum - 1989  
General Gordon Sullivan**

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# ARAT

## ...Its Beginnings...

Rapid Reprogramming is becoming an established part of U.S. Army electronic warfare capabilities. In 1986, the Army began to address the need for a capability to rapidly reprogram weapons systems. Participation in U.S. Air Force Exercise SERENE BYTE, from 1986 through 1989, provided valuable insight into reprogramming. During Operation DESERT STORM in 1990, Radar Warning Receivers (RWR) were reprogrammed in response to operational changes in threat signatures. In the same year, "WARM Policy And Program," AR 525-15 and DAMO-ZA Memorandum "Army Plan For Countering WARM" directed rapid reprogramming as a U.S. Army requirement. AR 525-15 was later renamed "Software Reprogramming Policy For Target Sensing Weapons Systems."

The ARAT (Army Reprogramming Analysis Team) Implementation Plan was distributed in 1991, directing formation and staffing of an ARAT Threat Analysis (TA) Center collocated with the U.S. Air Force Air Warfare Center (USAFWC) at Eglin AFB, Florida. Communications-Electronics

Command (CECOM) Software Engineering Directorate (SED) was designated by Army Material Command (AMC) in the same year to lead this effort. The result was staffing of a project office which later became Army (Target Sensing Systems) Rapid Reprogramming (ATRR) Project Office (PO). An ARAT Implementation Plan, issued in 1992, defined program activities for rapid reprogramming. In 1993, ARAT was officially sanctioned as a project when its draft charter was signed by Major General Otto J. Guenther. ARAT now operates under a Project Plan that defines programs and activities to 1999.  
**POC:** Sok Kim DSN 992-1337.

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## THE ARAT (DRAFT) CHARTER



The ARAT Draft Charter for Rapid Reprogramming Support to Army Target Sensing Systems (ATSS) was signed on 8 December 1993 by MG Otto J. Guenther. It is being circulated for signature by the Executive Committee and defines the purpose of the project office located at Fort Monmouth, New Jersey. This includes orchestrating those activities necessary to rapidly reprogram ATSS. The Draft Charter will authorize the

Software Engineering Directorate to directly coordinate with the Deputy Chief of Staff for

Intelligence (DAMO-POS), the Deputy Chief of Staff for Operations (DAMO-FDI), HQ, Department of the Army, HQ, Training and Doctrine Command (TRADOC), HQ, U.S. Army Intelligence and Security Command (INSCOM) and applicable defense agencies.

Current plans are to designate CECOM as the Army Lead Command to budget, plan and execute ATSS support. An Executive Steering Committee will be formed to provide program oversight, guidance, conduct In-Progress-Reviews, resolve major issues, and make recommendations to the Milestone Decision Authority. Functional sub-committees will convene to build the program and budget, develop plans, establish test criteria, and coordinate program reviews.  
**POC:** Sok Kim/Tom Hanlon/  
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## **BRAVE BYTE 94 PREVIEW**

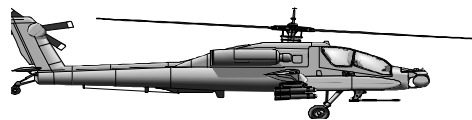
Army Rapid Reprogramming has been established as an exercise objective during the conduct of Atlantic Command sponsored JCS Exercise AGILE PROVIDER 94. Commander, XVIII Airborne Corps is the supported Army Component Commander. TRADOC, CECOM and the Program Manager, Aviation Electronic Combat (PM-AEC) are supporting commands/agencies. To be conducted during the period 18 April through 6 May 1994 and designated BRAVE BYTE 94, the reprogramming exercise will focus on standardizing message formats and the utility of an Electronic Bulletin Board System (BBS) to exchange reprogramming data. Both of these areas were noted in previous exercise lessons learned as needing improvement.

A BBS has recently been activated by the ARAT Threat Analysis activity. During the BRAVE BYTE 94 exercise, participants will have the capability to access the BBS, obtain up-to-the-minute reprogramming information and query other members of the ARAT community. Four developmental formatted message templates will be posted to the BBS to facilitate and standardize the exchange of

reprogramming data. Assuming the BBS and formatted messages resolve previous deficiencies, they will be staffed through appropriate command channels for inclusion into Army reprogramming doctrine, tactics, techniques and procedures. **POC:** Ken Kragh /DSN 992-6003; Norm Svarrer/ DSN 872-8899.

## **ARAT SUPPORTS ARMY'S NEW STRATEGY**

The modern battlefield hosts complex and sophisticated



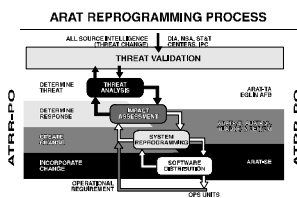
weapons. One category of these weapons is Army Target Sensing Systems (ATSS). ATSS are smart or brilliant munitions, sensors, processors, aircraft and armored vehicle survivability equipment that depend upon threat identification systems, for targeting, identification, and warning. The introduction of new threat systems, changes to existing threat systems such as modification or malfunction, or using a new operating mode, not previously observed can adversely affect ATSS operations. As new threats

become available or as threat parameters change, there is the risk that U.S. and allied systems will not correctly identify and counter the threat in a timely manner. Another possibility is that incorrect countermeasures may be implemented, putting friendly forces at risk. With the continued development and reliance on ATSS, procedures and methodology must be developed to rapidly counter any threat to the operational capability of these sophisticated systems.

An essential option to counter this threat is the rapid reprogramming of U.S. and allied equipment both in peacetime, and during conflicts. The Army Reprogramming Analysis Team (ARAT) is a networked group of organizations working together in support of ATSS. It is composed of a Threat Analysis Team (ARAT-TA), three Software Engineering Teams (ARAT-SE) and an Army (Target Sensing System) Rapid Reprogramming Project Office (ATRR-PO). Future plans are to incorporate other activities into the process.

Experience in Operations DESERT SHIELD and DESERT STORM highlighted

the need for the Army to establish and implement a complete system for software reprogramming of mission critical aircraft, air defense, intelligence/electronic warfare, and fire support systems in a rapid manner. To address this need, a comprehensive software reprogramming infrastructure is required from signature identification through installation of software changes in the field.



The Communications-Electronics Command (CECOM), Research Development and Engineering Center (RDEC), Software Engineering Directorate (SED), ATRR-PO is responsible for overall coordination of ARAT operations and the fielding of hardware and software tools to support ARAT operations. The mission of the ATRR-PO includes defining and establishing infrastructure, standards and procedures for supporting all phases of rapid reprogramming, specifically including (1) threat signature change detection and analysis, (2) ATSS impact analysis, (3) software reprogramming, and (4) software distribution and installation in the field.

The ARAT-TA (see Figure 1 on Page 5) has the primary responsibility to provide threat analysis data for U.S. Army TSS to the appropriate ARAT-SE, and ARAT SCs. There are two operational work levels for the ARAT-TA: normal and crisis. During normal work operations, the ARAT-TA is involved in threat analysis for ATSS block upgrades or training to be better prepared for crisis operation. During crisis operations, they must switch to a 24 hour operational cycle and add personnel in order to provide a minimum reaction time to changes in the battlefield threat environment.

The ARAT-TA, along with other intelligence assets, identifies new or changed signatures during the threat analysis phase which affect U.S. Army systems. They provide an initial impact assessment of these changes along with a recommendation for software or procedural changes which is forwarded to the tactical commander, ARAT-SC and the ARAT-SE. After software reprogramming or procedural changes are made, depending on the nature of the signature analysis, the ARAT-TA coordinates electronically in distributing changes to tactical commanders through a series of formatted messages. The software is then distributed to be loaded on the operational target sensing systems. This final step completes the ARAT process which is time

sensitive, since future conflicts are expected to be of short duration.

The ATRR-PO, located at CECOM, RDEC SED, Fort Monmouth, New Jersey integrates the horizontal and vertical reprogramming process for the ARAT architecture.

POC: ATRR-PO/Sok Kim/ DSN 992-1337; ARAT-TA /LTC Napoleon/DSN 872-8899.

## ARAT TRAINING

The Army (Target Sensing Systems) Rapid Reprogramming Project Office (ATRR-PO) has scheduled an ARAT Technical and Awareness Training Course on 7 - 10 June 1994. The training will be conducted by Syracuse Research Corporation and consists of lectures in Radar Fundamentals, Electronic Warfare Databases (EWIR, EDMS and CAEWIS), and ARAT policies and procedures.

The course, classified SECRET, will be held at Fort Monmouth, New Jersey. The

class size is limited. The tentative agenda is:

**one day ARAT Awareness**  
**one day Radar**  
**Fundamentals**  
**two days database training**

Additional time will be allotted for hands-on demonstration and training. These courses, which are conducted periodically, are ARAT's answer to promoting knowledge and awareness of rapid reprogramming.

Previous training courses have included Computer Aided Electronic Warfare Information System (CAEWIS) fundamentals and Electronic Warfare Integrated Reprogramming (EWIR) database training. Sixteen members of the ARAT community were trained on the CAEWIS. This is a database tool developed under contract by Rome Laboratory which allows electronic warfare engineers and ARAT software technicians to analyze and document threat changes that impact fielded, electronic warfare systems. CAEWIS provides information from various sources, organizes the data into electronic warfare system specific subsets, and depicts the data in various graphic and textual formats. The course was taught by Mr. I.B. Weaver of the United

Center (USAFAWC), Eglin AFB, Florida.

Twenty-six military and civilians attended a five day training course for EWIR. This was divided into two sessions consisting of training in Radar Fundamentals and EWIR database processing. The ATRR-PO will continue to offer specialized training to the rapid reprogramming community. An example is the demonstration and training on the Threat Intelligence Data Extraction System (TIDES), which will be scheduled at a time and date to be announced. **POC:** Ken Kragh/Verne Pedro; DSN: 992-6003.

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### **... MEET THE ARAT BULLETIN STAFF...**

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be published quarterly. It is intended to provide the ARAT community with current information. You are invited to submit input for improving this publication. Also if you have an article of interest for publication, fax it to the Editor at (908)-532-5238. Include your name, telephone number and source of information.

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### **Event Calendar**

**MLV Conference**  
**(Memory Loader Verifier)**  
**April 26-27**  
**Fort Monmouth**

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**Exercise BRAVE BYTE**  
**April 18-May 6**  
**(see story on Page 2)**

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**EWIRDB Conference**  
**Late May**  
**W-P AFB**

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**ARAT**  
**Awareness Training**  
**June 7-10**  
**Fort Monmouth**

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States Air Force Air Warfare

**"ARAT BULLETIN" will**